

Mark Scheme (Results)

Summer 2008

GCE

GCE SNAB Biology (6135/01)

GENERAL INFORMATION

The following symbols are used in the mark schemes for all questions:

Symbol	Meaning of symbol
; semi colon	Indicates the end of a marking point
eq	Indicates that credit should be given for other correct alternatives to a word or statement, as discussed in the Standardisation meeting
/ oblique	Words or phrases separated by an oblique are alternatives to each other
{ } curly brackets	Indicate the beginning and end of a list of alternatives (separated by obliques) where necessary to avoid confusion
() round brackets	Words inside round brackets are to aid understanding of the marking point but are not required to award the point
[] square brackets	Words inside square brackets are instructions or guidance for examiners

Crossed out work

If a candidate has crossed out an answer and written new text, the crossed out work can be ignored. If the candidate has crossed out work but written no new text, the crossed out work for that question or part question should be marked, as far as it is possible to do so.

Spelling and clarity

In general, an error made in an early part of a question is penalised when it occurs but not subsequently. The candidate is penalised once only and can gain credit in later parts of the question by correct reasoning from the earlier incorrect answer.

No marks are awarded specifically for quality of language in the written papers, except for the essays in the synoptic paper. Use of English is however taken into account as follows:

- the spelling of technical terms must be sufficiently correct for the answer to be unambiguous
e.g. for amylase, 'ammalase' is acceptable whereas 'amylose' is not
e.g. for glycogen, 'glicojen' is acceptable whereas 'glucagen' is not
e.g. for ileum, 'illeum' is acceptable whereas 'ilium' is not
e.g. for mitosis, 'mytosis' is acceptable whereas 'meitosis' is not
- candidates must make their meaning clear to the examiner to gain the mark.
- a correct statement that is contradicted by an incorrect statement in the same part of an answer gains no mark - irrelevant material should be ignored.

Question Number	Answer	Mark
1(a)	<ol style="list-style-type: none"> 1. reference to columns being {smaller / narrower /eq}(in visual cortex for left eye) /converse ; 2. (sensory) {neurone / axon} {shorter neurone / reduced growth} (for left / deprived eye) converse ; 3. {fewer / shorter dendrites} / fewer {synapses / branches} (in left/deprived eye) / eq / converse ; 	max (2)

Question Number	Answer	Mark
1(b)	<ol style="list-style-type: none"> 1. reference to {critical/ sensitive} period / critical window (in visual development) ; 2. idea that if one eye is deprived of {stimulation/light}, {neurones /dendrites/synapses / columns} do not develop / eq ; 	(2)

Question Number	Answer	Mark
1(c)	reference to visual deprivation studies e.g. cataract removal from children, bandaging of eyes / reference to development of distance perception e.g. Muller-Lyer	(1)

Question Number	Answer	Mark
2(a)	<ol style="list-style-type: none"> 1. activity in basal ganglia (of treated brain) is {greater than in untreated brain / lower than in healthy brain} ; 2. activity in motor cortex (of treated brain) is {less than in untreated brain / same as in healthy brain} ; 3. drug stimulates release of dopamine / eq ; 4. muscles now {more in control / just tapping fingers / fewer spasms} ; 	max (3)

Question Number	Answer	Mark
2(b)	<ol style="list-style-type: none"> 1. correct reference to calcium ions required ; 2. (dopamine) released at the (pre)synaptic membrane ; 3. by exocytosis /reference to vesicles fusing ; 4. idea of <u>diffuses</u> across (synaptic cleft) ; 5. binds to {receptors / eq} on post-synaptic membrane ; 6. {sodium ion / cation} channels open ; 7. sodium ions enter ; 8. depolarisation of post-synaptic membrane / eq ; 	max (4)

Question Number	Answer	Mark
2(c)	<ol style="list-style-type: none"> 1. dopamine cannot cross blood brain barrier / eq ; 2. therefore L-dopa is used /eq ; 3. which is converted into dopamine (in the brain) ; <p>OTHER DRUGS:</p> <ol style="list-style-type: none"> 4. could have a similar shape to dopamine / eq ; 5. bind to dopamine receptors ; 6. could inhibit enzymes which break down dopamine ; 7. correct reference to selegiline ; 8. maintaining a high concentration of dopamine ; 	<p>max (4)</p>

Question Number	Answer	Mark
3(a)(i)	<ol style="list-style-type: none"> 1. reference to oxygen (concentration) decreasing / eq ; 2. greater (decrease) when ADP is added ; 3. (oxygen used to) convert ADP to ATP (in respiration) ; 4. oxygen is needed for respiration / eq ; 5. correct reference to <u>oxidative phosphorylation</u> ; 6. reference to {ADP concentration / eq} is limiting ; 	max (3)

Question Number	Answer	Mark
3(a)(ii)	reduced NAD / NADH / NADH ₂ ;	(1)

Question Number	Answer	Mark
3(a)(iii)	cristae / inner membrane / stalked particle ;	(1)

Question Number	Answer	Mark
3(a)(iv)	<ol style="list-style-type: none"> 1. hydrogen atoms split into protons and electrons / eq ; 2. electrons transferred along electron carriers / a series of redox reactions / eq ; 3. oxygen is the terminal electron acceptor / water is formed ; 4. {protons / eq} moved into intermembrane space / eq ; 5. {protons / eq} move (into matrix) down a {concentration / electrochemical} gradient ; 6. through stalked particles / ATP synthetase /eq ; 7. correct ref. to chemiosmotic theory ; 8. (ATP)formed by {phosphorylation of ADP / oxidative phosphorylation } / eq ; 	max (3)

Question Number	Answer	Mark
3(b)(i)	<ol style="list-style-type: none"> 1. correct reference to ATP (supplies energy) for active transport / reference to sodium-potassium pump / eq ; 2. sodium ions pumped out (of the axon) / restores (membrane to) resting potential ; 	(2)

Question Number	Answer	Mark
3(b)(ii)	<ol style="list-style-type: none"> 1. correct reference to ATP (supplies energy) for active transport / reference to sodium-potassium pump / eq ; 2. (pumps sodium ions out) of inner segment / maintains (more) negative charge inside the membrane / eq ; 	(2)

Question Number	Answer	Mark
4(a)(i)	<p>SLOW TWITCH has:</p> <ol style="list-style-type: none"> 1. more mitochondria ; 2. more myoglobin ; 3. less sarcoplasmic reticulum ; 4. more capillaries ; 5. less (stored) glycogen ; 6. less creatine phosphate ; 7. more resistant to fatigue / more likely to be aerobic / eq ; 	max (2)

Question Number	Answer	Mark
4(a)(ii)	prey ;	(1)

Question Number	Answer	Mark
4(a)(iii)	<ol style="list-style-type: none"> 1. predators have more fast twitch (than slow twitch) ; 2. anaerobic respiration / glycolysis is used / eq ; 	max (2)

Question Number	Answer	Mark
4(b)	<ol style="list-style-type: none"> 1. (lactate) removed from muscle / diffuses into blood stream / enters liver ; 2. (lactate) converted / eq / to pyruvate ; 3. reference to role of {NADH / eq} ; 4. pyruvate {oxidised to carbon dioxide and water / enters Krebs cycle} / eq ; 5. reference to higher oxygen consumption / greater oxygen debt ; 6. (some) lactate {converted / eq} to glycogen (in liver) ; 	max (3)

Question Number	Answer	Mark
4(c)	<ol style="list-style-type: none"> 1. correct reference to homeostasis ; 2. correct reference to negative feedback ; 3. changes to (core) temperature detected by {hypothalamus / thermoregulatory centre} ; 4. (arteriole) {vasodilation / shunt vessel constricts} increases blood flow (to the skin / tongue) / eq ; 5. increase loss of heat from (skin / tongue / surfaces) / loss of heat from (skin / tongue / surfaces) has a cooling effect ; 	max (4)